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a memory coupled to the controller, the memory comprising a computer-readable medium having a computer-readable program embodied therein for directing operation of the substrate processing system, the computer-readable program including

a first set of instructions to control the gas-delivery system to flow a gaseous mixture containing flows of the silicon-containing gas, the fluorine-containing gas, the nitrogen-containing gas, and the oxygen-containing gas;

a second set of instructions to control the plasma generating system to generate a plasma from the gaseous mixture;

a third set of instructions to control the substrate processing system to deposit a nitrogen-containing fluorinated silicate glass layer onto the substrate from the plasma generated from the gaseous mixture; and

a fourth set of instructions to control the substrate processing system to deposit a barrier layer to contact the nitrogen-containing fluorinated silicate glass layer below or above the nitrogen-containing fluorinated silicate glass layer.

30. The substrate processing system of claim 29 wherein the plasma generating system is operatively coupled to the process chamber for generating an *in situ* plasma from the gaseous mixture in the process chamber, and wherein the substrate support is configured to support the substrate in the process chamber during substrate processing.

REMARKS

Claims 1-30 are pending.

Claims 1-3, 14, 17, 26, and 29 have been amended. No new matter has been introduced. Applicants believe the claims comply with 35 U.S.C. § 112.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

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PATENT

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Please amend claims 1-3, 14, 17, 26, and 29 as follows. The remaining claims are unamended, but are reproduced below for the Examiner's convenience and reference.

1. (Amended) A method for depositing a layer on a substrate in a process chamber, the method comprising:

supplying a gaseous mixture to the process chamber, the gaseous mixture comprising a silicon-containing gas, a fluorine-containing gas, an oxygen-containing gas, and a nitrogen-containing gas;

providing energy to the gaseous mixture to deposit a nitrogen-containing fluorinated silicate glass layer onto the substrate; and

forming a barrier layer over the nitrogen-containing fluorinated silicate glass layer.

2. (Amended) The method of claim 1 [**further comprising forming a] wherein the barrier layer comprises at least one of tantalum, tantalum nitride, silicon nitride, and silicon-carbon [over the nitrogen-containing fluorinated silicate glass layer].**

3. (Amended) The method of claim [2] 1 further comprising forming a metal layer over the barrier layer.

14. (Amended) [**The method of claim 1 wherein the nitrogen-containing fluorinated silicate glass layer is formed over]** A method for depositing a layer on a substrate having a barrier layer in a process chamber, the method comprising:
supplying a gaseous mixture to the process chamber, the gaseous mixture comprising a silicon-containing gas, a fluorine-containing gas, an oxygen-containing gas, and a nitrogen-containing gas; and

providing energy to the gaseous mixture to deposit a nitrogen-containing fluorinated silicate glass layer onto the barrier layer.

17. (Amended) The method of claim 14 wherein the barrier layer comprises at least one of silicon-carbon, silicon nitride, tantalum and tantalum nitride.

26. (Amended) The method of claim 25 wherein the barrier layer comprises at least one of silicon-carbon, silicon nitride, tantalum and tantalum nitride.

29. (Amended) A substrate processing system comprising:
a housing defining a process chamber;
a substrate support configured to support a substrate during substrate processing;

a gas delivery system configured to introduce gases into the process chamber, including sources for a silicon-containing gas, a fluorine-containing gas, an oxygen-containing gas, and a nitrogen-containing gas;

a plasma generating system;

a controller for controlling the plasma generating system, the gas-delivery system, and the pressure-control system; and

a memory coupled to the controller, the memory comprising a computer-readable medium having a computer-readable program embodied therein for directing operation of the substrate processing system, the computer-readable program including

a first set of instructions to control the gas-delivery system to flow a gaseous mixture containing flows of the silicon-containing gas, the fluorine-containing gas, the nitrogen-containing gas, and the oxygen-containing gas;

a second set of instructions to control the plasma generating system to generate a plasma from the gaseous mixture; **[and]**

a third set of instructions to control the substrate processing system to deposit a nitrogen-containing fluorinated silicate glass layer onto the substrate from the plasma generated from the gaseous mixture; and

a fourth set of instructions to control the substrate processing system to deposit a barrier layer to contact the nitrogen-containing fluorinated silicate glass layer below or above the nitrogen-containing fluorinated silicate glass layer.